DOOSAN Document Transmittal

Upper Trishuli-1 HEP (216MW)

Date	DT No.:	SHEET
2022-03-31	UT1-HEP-DHI-PC-D-0019	1 OF 1

DOOSAN NEPAL BRANCH OFFICE	Address & Contact No. : Four Square Building, Naxal, Kathmandu, Nepal (P.O Box : 1387) + 977 1 692 3014	Project No. H20002	DOCUMENT DISPATCHED BY Courier Service ☐ Messenger ☐ Post-Air Freight ☐ Document System or E-mail ■ By hand ■
DOCUMENT DISTRIBUTION	■ POWER CHINA (Subcontractor) ☐ Doosan's Site Office		
SUBJECT	Review Note RN-0108_Outline Drawing of Diversion Tunnel Lining		

S. N.	REVIEW NOTE NO.	REVIEW STATUS	DWG. / DOC. NO.	REV.	DWG. TITLE / DOC. DESCRIPTION	REMARK
1	RN-0108	RR	UT1-C-010-CVL-DG-42005	0A	Outline Drawing of Diversion Tunnel Lining	
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Received by :

Date :

Legend of Review Status
A : APPROVED
AN : APPROVED AS NOTED
RR : RETURN FOR RESUBMISSION
FI : FOR INFORMATION

DHI STAMP

Doosan Heavy Industries & Construction Co. Ltd. DOOSAN Branch Office Nepal

Issued by DHI

Youngsoo Son

Project Manager

Email: youngsoo.son@doosan.com
Doosan Heavy Industries & Construction Co., Ltd.

Discipline : Civil

UPPER TRISHULI-1 HEP (216MW)

Client	**Nepal Water and Energy Development Company Private Limited**
Owner's Engineer	**Tractebel Engineering GmbH / Jade Consult**

REVIEW NOTE

Contractor	**Doosan Heavy Industries & Construction Co., Ltd.**		
Title of the Document	Diversion Tunnel, outline drawing		
Document No.	UT1-C-010-CVL-DG-42005	Revision	0A
Date of Documents	15.03.2022	Received Date	16.03.2022
Transmittal Form No.	UT1-HEP-DHI-D-0184		
Previous Review Date/Status	N/A	Prev. Review Note No.	N/A
Review Note No.	**RN-0108**	**Present Review Date**	**30.03.2022**
		Present Review Status	**RR**

A: Approved AN: Approved as Noted RR: Returned for Resubmission FI: For Information, only.

General Comments

1. The document has been submitted to the Employer/ OE not respecting time for review between document submission and commencement of the works.
2. The comments of review note RN-0082, submitted with OE-TJ-UT1-OUT Site-DHI 059 on 09th of March 2022 and other applicable review notes are valid for this review note as well.

Comments

1. Maximum block length/ contraction joints shall be considered and defined.
2. Further OE´s comments are indicated in red in the Annex.

ANNEX:

UT1-C-010-CVL-DG-42005_0A_comments

DISCLAIMER

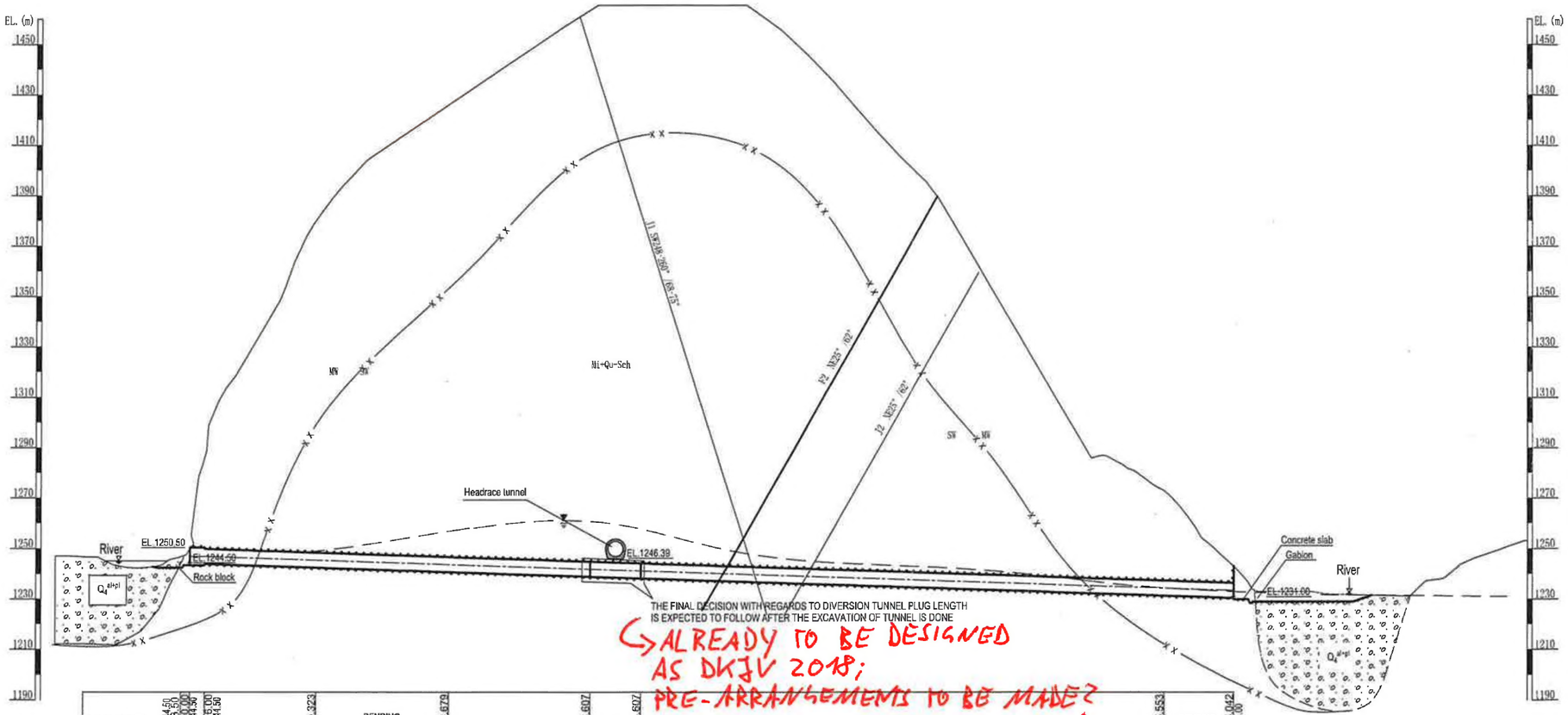
Any approval will not release the Contractor from any of his obligations under the Contract.

Sebastian Beck, Chief Design Engineer

ANNEX RN-0108
30/03/2022 Mt - BE

LONGITUDINAL PROFILE OF DIVERSION TUNNEL

SCALE 1:1000



ALREADY TO BE DESIGNED AS DKJV 2018; PRE-ARRANGEMENTS TO BE MADE?

CHAINAGE(m)	EL.1244.50 D0+000.00	D0+005.00 EL.1245.50	D0+050.323	BENDING SECTION	D0+102.679	D0+158.607	PLUG	D0+178.607	D0+385.553	BENDING SECTION	D0+413.042 EL.1231.00
Gradient	0%		3.32%								
Rock class type	III				III~II			IV	III		IV
Support type	D	C	B		A-B	E	A-B	C	B		C
Drainage hole	No weep hole before chainage D0+050.000			Weep hole,@3.0m×3.0,Ø45mm,0.5m in rock after chainage D0+050.000							
Typical cross section	D0+000.00 D5	D0+005.00 D3	D0+020.00 D2	D0+054.175 D1-D2		D0+156.607 D4	D0+178.607 D1-D2	D0+207.580 D3	D0+226.935 D2		D0+346.500 D3 D0+413.042

RECEPTION DATE
↓
COMMENCEMENT OF WORKS

COMMENTS TO SHEET 2 OF THIS DOCUMENT ARE VALID AS WELL.

NOTE

1. This set of drawings are the outline of diversion tunnel.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. Symbol description:
   A-Line is the design excavation line.
   D denotes deformed bar, yield strength of the deformed bar is 500MPa;
4. Strength specification of concrete & shotcrete:
   (1) Concrete class E: Cylinder specified compressive strength 24MPa at 28 days.
   (2) Shotcrete: Cylinder specified compressive strength 25MPa at 28 days.
5. Grouting requirement: consolidation grouting pressure should be determined according to surrounding rock condition and grouting experiment. Consolidation grouting hole is no less than 47.5mm.
6. The construction joints shall be determined by constructor according to construction technology, the rebar shall be continued at construction joint.

REFERENCE DRAWINGS

UT1-C-D10-CVL-DG-42003	EXCAVATION AND INITIAL SUPPORT DRAWING OF DIVERSION TUNNEL

SYMBOL AND LEGEND

FOR APPROVAL

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE PRELIMINARY FOR APPROVAL. IT CAN BE CHANGED IN THE EXECUTION STAGE
THIS DRAWING IS THE PROPERTY OF DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. IT IS NOT TO BE COPIED OR USED IN ANY WAY DETRIMENTAL TO THE COMPANY.

REV. NO.	DATE	DESCRIPTION	DRAWN	CHKD.	APPD.
0A	15.MAR.2022	FIRST ISSUE	DONG Z.Z.	LEI Y.G.	HAN J.B. LUO L.

PROJECT TITLE
Upper Trishuli-1 HEP (216MW)

OWNER
NWEDC

OWNER'S ENGINEER
TRACTEBEL jade CONSULT

CONTRACTOR
DOOSAN Doosan Heavy Industries & Construction

DRAWING TITLE
OUTLINE DRAWING OF DIVERSION TUNNEL LINING(1/2)

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-010-CVL-DG-42005-1	1 OF 2	0A

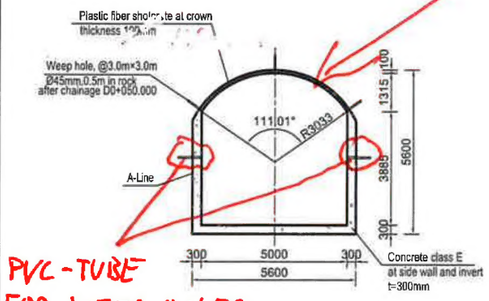
A1 (594 x 841 MM)

ANNEX RN-0108
30/03/2022
Ver.: B/2

HIGH FLOW VELOCITIES WITH ABRASIVE MATERIAL SHALL BE CONSIDERED ⇒ FULL REINFORCED CONCRETE LINING SHALL BE CONSIDERED

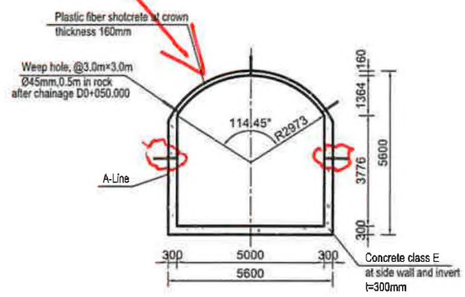
TYPICAL CROSS SECTION D1
(for rock class II)

SCALE 1:100



TYPICAL CROSS SECTION D2
(for rock class III)

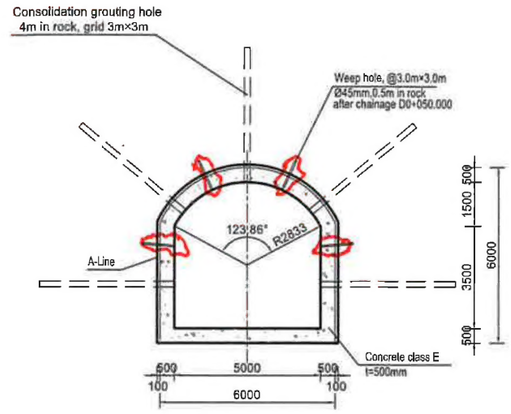
SCALE 1:100



PVC-TUBE FOR WEEP HOLES IN REINFORCED CONCRETE LINING
↳ EPC CONTRACT ANNEX 13, PART C, 1. CONSTR. SPEC., 18.3.24.

TYPICAL CROSS SECTION D3
(for rock class IV)

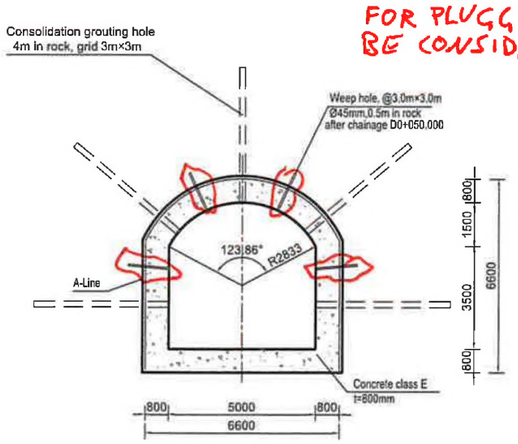
SCALE 1:100



TYPICAL CROSS SECTION D4
(for intersection of headrace and diversion tunnel)

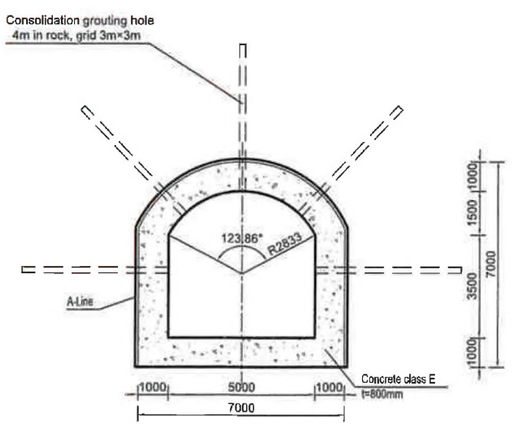
CHAINAGE D0+158.607-D0+178.607
SCALE 1:100

PRE-MEASURES FOR PLUGGING TO BE CONSIDERED?



TYPICAL CROSS SECTION D5
(for inlet section) / OUTLET SECTION?

CHAINAGE D0+000.00-D0+006.00
SCALE 1:100



HORIZONTAL WATERSTOPS ACCORDING TO UT1-C-010-CVL-MS-80013, SUBCHAPTER 9.3.2(2) HAVE TO BE INDICATED WHERE APPLICABLE

SCALE: 1:100 0 1 2 3 4 5m

- LEAN CONCRETE?
- WEEP HOLES IN TUNNEL BOTTOM SLAB?
- BLOCK JOINTS / DETAILS?
- TRANSITION CONCRETE LINING ↔ SHOTCRETE LINING TUNNEL ROOF? → HIGH FLOW VELOCITIES → CAVITATION

NOTE

1. This set of drawings are the outline of diversion tunnel.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. Symbol description:
   A-Line is the design excavation line.
   D denotes deformed bar, yield strength of the deformed bar is 500MPa;
4. Strength specification of concrete & shotcrete:
   (1) Concrete class E: Cylinder specified compressive strength 24MPa at 28 days.
   (2) Shotcrete: Cylinder specified compressive strength 25MPa at 28 days.
5. Grouting requirement: consolidation grouting pressure should be determined according to surrounding rock condition and grouting experiment. Consolidation grouting hole is no less than 47.5mm.
6. The construction joints shall be determined by constructor according to construction technology, the rebar shall be continued at construction joint.

CLASS OF FINISH TO BE INDICATED ACCORDING TO CONTRACT ANNEX 13, C, 1, 15.1.9(2)

REFERENCE DRAWINGS

UT1-C-010-CVL-DG-42003	EXCAVATION AND INITIAL SUPPORT DRAWING OF DIVERSION TUNNEL

METHOD STATEMENT GENERAL LAYOUT DIV. TUNNEL

SYMBOL AND LEGEND

FOR APPROVAL

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE PRELIMINARY FOR APPROVAL. IT CAN BE CHANGED IN THE EXECUTION STAGE
THIS DRAWING IS THE PROPERTY OF DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. IT IS NOT TO BE COPIED OR USED IN ANY WAY DETRIMENTAL TO THE COMPANY.

REV. NO.	DATE	DESCRIPTION	DRAWN	CHKD.	APPD.
0A	15.MAR.2022	FIRST ISSUE	DONG Z.Z.	LEI Y.G.	HAN J.B. LUO L.

PROJECT TITLE
Upper Trishuli-1 HEP (216MW)

OWNER
NWEDC

OWNER'S ENGINEER
TRACTEBEL ENGIE · Jade Consult

CONTRACTOR
DOOSAN Doosan Heavy Industries & Construction

DRAWING TITLE
OUTLINE DRAWING OF DIVERSION TUNNEL LINING(2/2)

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-010-CVL-DG-42005-2	2 OF 2	0A

A1 (594 x 841 MM)